

VOCs Speciation from Steam Boiler Stacks of Industries Located in Naucalpan

Gerardo M. Mejia, Dzoara D. Tejeda, Maria P. Bremauntz, Alfredo Valdez, Pedro C. Montufar, Marco A. Martinez, and Maximo J. Sierra
Instituto Tecnológico y de Estudios Superiores de Monterrey

Carlos A. Gonzalez
Municipality of Naucalpan

Abstract Results of VOCs speciation from industrial steam boiler stacks located in Naucalpan are presented and discussed. This municipality is located north of the Metropolitan Zone of the Valley of Mexico (MZVM). Speciation of VOCs is important to generate information about sources of pollution, to update emission inventories, to study the dynamics of pollutants in the atmosphere, and to estimate possible risks of population exposure. This information is valuable for decision making on air pollution control strategies. Samples from 35 steam boilers from industries burning Diesel, LPG, or CNG were taken using the US-EPA Method 18. Selected samples from the use of different fuels were analyzed using gas chromatography and flame ionization detection (GC-FID) according to US-EPA protocol TO-14. The VOCs analyzed included alkanes of 9 carbons or less, alkenes of 7 carbons or less and aromatics (families of benzene). The results show consistency on the VOCs detected on Diesel samples. The main compounds found were 1-Butene+iButylene, m/p-Xylene, Ethane, Propene, Propane, Acetylene, 2Me-1Butene, and Toluene. The average concentrations of these compounds were in the range of 130 to 385 ppbC. The results of LPG samples did not show a definite pattern of VOCs, although light components predominate and, in some samples, Toluene and Xylene. These last components were not expected for industries reporting the use of LPG, perhaps due to the use of a combination of fuels and mistakes in the reports of fuel used at the time of sampling. The analysis of CNG samples show predominance of light VOCs, in the range of 90 to 300 ppbC. As in the case of LPG, some aromatics showed high concentrations in some samples analyzed perhaps due to the use of different fuels in the boiler. The results of this study are the first results of VOCs speciation obtained from exhaust gases from stacks of Mexican industries. The data reported are valuable to analyze emission inventories of VOCs and to better understand the dynamics of pollutants in the MZVM.